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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/068,735	02/06/2002	Scott T. Holmes	38190/234784	8733

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EXAMINER	
KOCH, GEORGE R	

ART UNIT	PAPER NUMBER
1734	

DATE MAILED: 03/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/068,735	HOLMES ET AL.	
	Examiner	Art Unit	
	George R. Koch III	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) *12-19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6-11* is/are rejected.

7)☒ Claim(s) *5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-4, 6-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lichtenwalner (cited on IDS filed 02/06/02) and Krause (US Patent 5,886,313).

For the purposes of examination, the word tape has been interpreted as comprising both tapes and tows (i.e., fibers). See applicant's definition in Specification, page 1, lines 9-12.

Lichtenwalner discloses a composite material collation machine comprising a laser heat source for heating the at least one fiber tape, a compaction device for pressing the fiber tape against a workpiece in a compaction region such that the fiber tape conforms to the contour of the workpiece and is adhered thereto, an inspection system for monitoring at least one of the fiber tape and the workpiece, the inspection system producing an output representative of at least one characteristic of at least one of the fiber tape and the workpiece, and a controller capable of receiving the output from the inspection system and automatically altering at least one system parameter defining an operational characteristic of the composite material collation machine based thereon (see Figure 1, and page 688, section 3).

Lichtenwalner does not disclose that the laser heat source is a laser diode array.

Krause discloses a method and apparatus of bonding sheets which utilizes a laser diode array in order to heat the sheets for bonding. Krause discloses that a laser diode system have important advantages, such as have long lifetimes of geater than 2000 hours, low to negligible maintenance costs and efficiencies of 30 to 50%.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized a laser diode array as disclosed in Krause in order to achieve long lifetimes, low maintenance costs, and improved heating efficiencies.

As to claim 2, the laser diode array of Krause as implemented is capable of irradiating a plurality of irradiation zones (see also Figures 2, 3 and 7, for example).

As to claim 3, Lichtenwalner discloses that with regard to bonding of tapes and workpieces, some of the focused laser energy should be aimed at the area on the fiber tape and some of the focused laser energy should be aimed at the workpiece (see Figure 1).

As to claim 4, Lichtenwalner discloses a focused infrared camera monitors an image of the fiber tape at the point of bonding, i.e., past the compaction region (see page 687 and 688, especially section 2).

As to claim 6, Lichtenwalner discloses that the temperature system measures the temperature of the nip, i.e., the fiber tape and the workpiece.

As to claim 7, Lichtenwalner discloses adjusting the temperature at the nip point, i.e., adjusting the temperature of the fiber tape and the workpiece (page 688, especially section 2)

As to claim 8, Lichtenwalner discloses a temperature sensor for measuring the temperature of the fiber tape (see section 3, on page 688).

As to claim 9. Lichtenwalner discloses a temperature sensor and controlling the laser heat source based on the temperature sensed at the nip point, i.e., at both the fiber tape and workpiece. Lichtenwalner does not disclose controlling individual diodes

in the laser array. However, Krause discloses using a laser diode array. Furthermore, one would appreciate that it would have been well known and conventional to utulize individual control of each diode would allow for closer tailoring of the temperature profile across the workpiece and tape and improve bonding. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such multiple diode control in order to improve bonding.

As to claim 11, Lichtenwalner discloses that the composite material collation machine comprises a fiber tape placement machine (see Figure 1)

5. Claims 4, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lichtenwalner and Krause as applied to claim 1 above, and further in view of Kitson (US Patent 5,562,788).

Lichtenwalner and Krause are silent as to the presence of a CCD or visual image camera for receiving images of the fiber tape after the fiber tape.

Kitson discloses a camera for receiving images of the fiber tape after the fiber tape (column 10, lines 39 to column 11, line 2). Kitson discloses that the images can be used to recognize defects in the tape laying process (see especially column 10, lines 7-38) and can thus be used to improve operation by allowing the operator or machine controller to take appropriate action. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized a image camera in order to recognize defects in the image laying process and make appropriate corrections as needed.

As to claim 6, Kitson discloses that the inspection system can generate outputs representative of a characteristic of the fiber tape, such as the placement of the fiber tape relative to another fiber tape. Kitson further discloses, as to claim 7, using the output of this characteristic to control placement of the fiber tape relative to another fiber tape and improve accuracy (see column 9, lines 17-32). Kitson discloses that this improves the accuracy of the fiber placement head and thus the quality of the completed item. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized an inspection system generating a characteristic such as the placement of the fiber tape relative to another tape and using the output of the controller to control the placement of the fiber tape relative to another tape in order to improve workpiece quality.

Furthermore, as to claims 6 and 7, monitoring and adjusting the rate of placement, tack of the tape, and compaction pressure are taken to be well known and conventional in fiber placement. One in the art would appreciate that all of these variables are inherently measured and adjusted by viewing the placement of the fiber tape as in Kitson, since improper rate of placement, tack of tape, and compaction pressure result in improper positioning of the fiber tape and are recognizable from such a signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the system of Kitson to measure and control these variables.

6. Claims 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lichtenwalner and Krause as applied to claim 1 above, and further in view of Albers (US Patent 5,066,032)

Lichtenwalner and Krause as applied do not disclose a marking device responsive to the controller for indicating defects on the fiber tape.

Albers discloses a marking device responsive to the controller for indicating marks on the fiber tape (see column 9, line 63 to column 10, line 18). One in the art would appreciate that such a marking device would allow for marking of critical areas, such as places to cut off portions. Such a marking device would also allow for marking of defective locations. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized a marking device in order to ensure proper identification of critical features on the workpiece.

Allowable Subject Matter

7. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: With regard to claim 5, the instant application is deemed to be directed to a non-obvious improvement over the subject matter disclosed in Lichtenwalner and Krause. The improvement comprises the inspection system further comprising a tack

monitoring device capable of measuring the molecular mobility of a resin in the fiber tape.

Response to Arguments

9. Applicant's arguments filed 12/15/2003 have been fully considered but they are not persuasive.

10. Applicant argues that Lichtenwalner does not apply to claims, because Lichtenwalner applies "fibers". This is not persuasive because applicant has defined, in the specification itself (see page 1, lines 9-12), that the definition of "tape" includes tows, i.e., fibers.

11. In response to applicant's argument that the references do not disclose some of the laser temperature techniquies, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George R. Koch III whose telephone number is (571) 272-1230 (TDD). If the applicant cannot make a direct TDD-to-TDD call, the applicant

can communicate by calling the Federal Relay Service at 1-800-877-8339 and giving the operator the above TDD number. The examiner can normally be reached on M-Th 10-7.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

George R. Koch III
February 28, 2004

RICHARD CRISPINO
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TECHNOLOGY CENTER 1700